N O T I C E

HSR Division | July 21,2003 | Notice No. 0121

Lockout/Tagout for Personal Safety
Reminder Only- No New Requirements

Purpose

There have been several incidents recently that indicate the need for increased emphasis on lockout/tagout requirements at the Laboratory. This Notice briefly describes some of those incidents (1) to remind you of the Laboratory's lockout/tagout requirements and (2) to inform personnel of upcoming changes to the Laboratory's lockout/tagout requirements.

Background

The following recent incidents at the Laboratory involved lockout/tagout implementation issues:

In **March 2003**, facility management submitted a work request that directed electricians and refrigeration craft workers to disconnect electrical and cooling water to a clean-room cooling unit. Programmatic personnel received some indication through electronic mail that facility management believed the area was "powered down." During disassembly of the clean room, programmatic personnel identified an unexpectedly energized (280-V) switch. They then located a breaker box on the floor above that contained four switches associated with the clean room. The programmatic personnel turned off the switches, verified zero voltage at the switch, and applied wire nuts to the switch wires. The switches in the breaker box were neither locked nor tagged out in accordance with Laboratory requirements. If the switches had been re-energized while the programmatic personnel were applying wire nuts to the switch wires, these workers could have been seriously injured or killed.

In **December 2002**, two electrical incidents occurred on a substation pad involving 13.2 -kV equipment. Although the investigators concluded that work was being conducted in a manner that would not result in harm to the workers, the nature of the work, involving both high-voltage utility systems and programmatic equipment, created a work environment in which two distinctly different types of electrical workers (linemen and R&D programmatic personnel) relied upon each other for their personal safety, without realizing the need and requirement for adequately verifying and assuring their own safety. Significant issues that arose during the investigation included energy control (e.g., lockout/tagout); landlord/tenant relationships; worker communications; multiple electrical disciplines working together; and the interface between utility power, facility power, and R&D equipment.

Background (cont)

In **May 2002**, programmatic personnel from several organizations were troubleshooting a ground fault trip that affects a series of four quadrupole magnets. During the troubleshooting, the workers made several tests to isolate the source of the ground fault. Finally, an intermittent ground was discovered between the cover on one of the magnets and the magnet lead, and the cover was adjusted to prevent shorting. A temperature switch was also found grounded and was insulated. When one of the workers took the locomotive cable and started to reconnect it to the bus bar, an arc occurred. A critique of the incident determined that the 100-V power supply was locked out according to the troubleshooting hazard control plan (HCP), but the HCP did not cover operation of the power supply without a load. The workers relied on meter readings and did not verify a zero-energy state before reconnecting the magnet power supply cables after the troubleshooting was completed.

Requirements/ Instructions

LIR 402-860-01, "Lockout/Tagout for Personal Safety," establishes the requirements for controlling hazardous energy while servicing, maintaining, modifying, and conducting similar work on equipment, machinery, and systems, with some exceptions that are noted in the LIR. These requirements exist to protect the worker and to ensure the implementation contained in 29 CFR 1910.147.

LIR 402-600-01, "Electrical Safety," provides requirements that must be implemented to perform work on energized electrical systems. However, the Electrical Safety LIR requires that the primary hazard mitigation for performing electrical work is to *de-energize* the circuit unless there is a compelling reason to conduct work on or near an energized circuit.

The Lockout/Tagout LIR states that workers must follow the 7 steps on the back of the lockout/tagout tag for a simple lockout/tagout. If workers are performing a complex lockout/tagout, they must develop and implement a specific written procedure either using Attachment B of the LIR or using the same information contained in Attachment B. A specific written procedure is required if

- the equipment, machinery, or system (EMS) has more than one energy type and two or more connecting means for that type of energy;
- the EMS has two or more energy sources;
- the EMS has a connecting means for an energy source that is not readily identifiable;
- the EMS has a connecting means that cannot be locked out; or
- the work involves lockout/tagout of safety-significant systems or shift/personnel changes.

Workers who perform lockout/tagouts, must first be trained by PS-13 and must then be authorized by their safety-responsible line manager to perform the work.

Upcoming Changes LIR 402-860-01 does not contain requirements that specifically address the coordination/integration of work activities, especially among different organizations. It also does not address some of the requirements contained in DOE Order 5480.19, "Conduct of Operations." The LIR is being revised to include these requirements and to address other issues noted during the Laboratory's self-assessment conducted in the Fall of 2002. The revised LIR is scheduled to be out for review in late August 2003.

Questions? Theresa Cull, HSR-5, may be reached at 7-7586 or at tcull@lanl.gov for questions or information pertaining to this notice.

REMEMBER – Lockout/Tagout can save your life!

---

*The OIC for this notice is **HSR5**, and the responsible division leader is the* **HSR-DL**. *This notice will remain in effect until a revision to* **LIR 402-860-01** *is published.*